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10/767,530	01/26/2004	Shih-Jong J. Lee	SV33	5790
29738	7590	11/02/2007	EXAMINER	
SHIH-JONG J. LEE			MOHR, ERIC JOHN	
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BELLEVUE, WA 98006			PAPER NUMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/767,530

Applicant(s)

LEE ET AL.

Examiner

Eric J. Mohr

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Image Region Partitioning using Pre-labeled Regions.

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The disclosure is objected to because of the following informalities:

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a. The following sentence, found on Page 2, lines 49-51, contains errors:

This is useful only for simple applications where all The prior art ZOI method uses the same distance metric for all components.

b. Page 7, lines 189, contains the word "firs" which the examiner has taken to be fire.

Appropriate correction is required.

Drawings

4. The drawings are objected to because Figure 5E appears to have been damaged during transmission. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

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examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2, 3, 7, and 8 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 further limits claim 1 to input an image and perform component labeling upon that image. Claim 1 already inputs a component labeled image. Claim 2 has been interpreted as: The fast image region partition method of claim 1 **wherein inputting a component labeled image comprises the steps of:** a) Input an input image; b) Perform component labeling using the input image to create the component labeled image.

Similarly claim 3 has been interpreted as: The fast image region partition method of claim 1 wherein the two pass ZOI creation step ~~further~~ comprises the steps of: a) Perform a first pass scan using the component labeled image to create a first pass intermediate distance image and a shortest distance component label image; b) Perform a second pass scan using the first pass intermediate distance image and the shortest distance component label image to create a background distance transform image and a updated shortest distance component label image.

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Claim 7 has been interpreted as: The adaptive image region partition method of claim 6 **wherein inputting a component labeled image comprises the steps of:** a) Input an input image; b) Perform component labeling using the input image to create the component labeled image.

Claim 8 has been interpreted as: The adaptive image region partition method of claim 6 wherein the adaptive two pass ZOI creation step ~~further~~ comprises the steps of: a) Perform a first pass scan using the component labeled image to create a first pass intermediate adaptive distance image and an adaptive shortest distance component label image; b) Perform a second pass scan using the first pass intermediate adaptive distance image and the adaptive shortest distance component label image to create an adaptive distance transform image and an updated adaptive shortest distance component label image.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Braspenning et al (US 6,963,664).

Consider claim 1, Braspenning discloses a fast image region partition method **(see column 1, lines 38-50 describing an image segmentation method capable of producing robust results with limited resources)** comprising the steps of: a) Input a component labeled image **(see column 4, line 66 to column 5, line 4 describing an image labeled with seed values)**; b) Perform a two pass ZOI creation method using the component labeled image to create a ZOI image **(see column 5, lines 35-54 describing a two-pass algorithm to define the image regions closes to each seed point)**.

Consider claim 6, Braspenning discloses an adaptive image region partition method **(see abstract)** comprises the steps of: a) Input a component labeled image **(see column 4, line 66 to column 5, line 4 describing an image labeled with seed values)**; b) Perform an adaptive two pass ZOI creation method using the component labeled image to create an adaptive ZOI image **(see column 5, lines 35-54 describing a two-pass algorithm to define the image regions closes to each seed point)**.

Consider claims 2 and 7, Braspenning discloses inputting a component labeled image using the steps of: a) Input an input image **(see column 6, lines 25-28)**; b) Perform component labeling using the input image to create the component labeled image **(see column 4, lines 17-65 which describes the process of labeling a digital image with seed pixels defining distinct regions)**.

Consider claim 3, Braspenning discloses the two pass ZOI creation step comprising the steps of: a) Perform a first pass scan using the component labeled image to create a first pass intermediate distance image and a shortest distance

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component label image; b) Perform a second pass scan using the first pass intermediate distance image and the shortest distance component label image to create a background distance transform image and a updated shortest distance component label image (**see column 5, lines 35-45 describing the iteration of two passes and column 5, lines 47-50 describing the process of updating a distance array and a closest seed array**).

Consider claims 4 and 5, Braspenning discloses the first and second pass scans depending on a selected set of adjacent neighbors and their distance lengths (**see column 5, lines 35-45 describing the use of the distance to get to each neighbor in the computation of the nearest seed component**).

Consider claim 8, Braspenning discloses the adaptive two pass ZOI creation step comprising the steps of: a) Perform a first pass scan using the component labeled image to create a first pass intermediate adaptive distance image and an adaptive shortest distance component label image; b) Perform a second pass scan using the first pass intermediate adaptive distance image and the adaptive shortest distance component label image to create an adaptive distance transform image and an updated adaptive shortest distance component label image (**see column 5, lines 35-45 describing the iteration of two passes and column 5, lines 47-50 describing the process of updating a distance array and a closest seed array**).

9. Claims 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Cong et al (US 6,956,961).

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Consider claim 11, Cong discloses a cell segmentation method comprising the steps of: a) Input a nuclei mask image (**see column 8, lines 43-48**); b) Input a cell mask image (**see column 9, line 45 to column 10, line 30 describing the process for creating a cell shape-indicative marker**); c) Perform nuclei region partition using the nuclei mask image to create nuclei mask ZOI (**see column 10, lines 61-67 where a watershed algorithm is applied to the nuclei mask image to determine cell boundaries**); d) Perform cell region separation using the cell masks and the nuclei mask ZOI to generate cell separated regions (**see column 11, lines 8-17 describing the use of a watershed algorithm using both the cell mask and nuclei mask to determine cell boundaries**).

Consider claim 12, Cong discloses an adaptive cell segmentation method comprising the steps of: a) Input a nuclei mask image (**see column 8, lines 43-48**); b) Input a cell mask image (**see column 9, line 45 to column 10, line 30 describing the process for creating a cell shape-indicative marker**); c) Perform adaptive nuclei region partition using the nuclei mask image to create adaptive nuclei mask ZOI (**see column 10, lines 61-67 where a watershed algorithm is applied to the nuclei mask image to determine cell boundaries**); d) Perform adaptive cell region separation using the cell masks and the adaptive nuclei mask ZOI to generate adaptive cell separated regions (**see column 11, lines 8-17 describing the use of a watershed algorithm using both the cell mask and nuclei mask to determine cell boundaries**).

Consider claim 13, Cong discloses further excluding the pixels close to the adaptive nuclei mask ZOI boundaries (**see figure 5A, label 514**).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Braspenning as applied to claim 8 above, and further in view of Gilge (US 5,666,212).

Consider claims 9 and 10, Braspenning discloses the first and second pass scans depending on a selected set of adjacent neighbors and their distance lengths **(see column 5, lines 35-45 describing the use of the distance to get to each neighbor in the computation of the nearest seed component)**. Braspenning does not explicitly disclose the distance lengths depending on their associated component labels. Gilge discloses an image segmentation algorithm using local windowing, also disclosing the possibility of local weighting for each window **(see column 5, line 59 to column 6, line 24)**.

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Braspenning, and modify the distance function to use local weighting for each seed region, as taught by Gilge, thus allowing images to be segmented into regions of varying size, as discussed by Gilge **(see column 1, line 65 to column 2, line 56)**.

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12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cong as applied to claim 12 above, and further in view of Gilge.

Consider claim 14, Cong discloses the adaptive nuclei region partition calculating cell size estimates (**see column 2, lines 57-60**). Cong does not explicitly disclose using these estimates as the weighting factor for the length function. Gilge discloses an image segmentation algorithm using local windowing, also disclosing the possibility of local weighting for each window (**see column 5, line 59 to column 6, line 24**).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Cong, and modify the process of cell segmentation including using the estimate of cell size as a weight in the length function, as taught by Gilge, thus allowing images to be segmented into regions of varying size, as discussed by Gilge (**see column 1, line 65 to column 2, line 56**).

Contact Information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric J. Mohr whose telephone number is (571) 270-5140. The examiner can normally be reached on 7:30am-5pm M-Th, 7:30am-4pm Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nick Corsaro can be reached on (571) 272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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